

WE CLAIM:

1. A method of decoding two-channel matrix encoded audio to reconstruct multichannel audio that approximates a discrete surround-sound presentation, comprising:

subband filtering the two-channel matrix encoded
5 audio into a plurality of two-channel subband audio
signals;

separately steering the two-channel subband audio signals in a sound field to form multichannel subband audio signals; and

10 synthesizing the multichannel subband audio
signals in the subbands to reconstruct the multichannel
audio.

2. The method of claim 1, wherein the reconstructed multichannel audio comprises a plurality of dominant audio signals.

3. The method of claim 2, wherein said dominant audio signals reside in different subbands.

4. The method of claim 3, wherein steering the two-channel subband audio signals comprises computing a dominance vector in said sound field for each said subband, said dominance vector being determined by the dominant
5 audio signals in the subband.

5. The method of claim 1, wherein subband filtering groups the subband audio signals into a plurality of bark bands.

6. The method of claim 1, wherein the two-channel matrix encoded audio includes at least left, right, center,

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signals, comprises:

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compute a set of gain values for each subband; and

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interpolation of the predetermined gain values surrounding

the dominance vector to define the set of gain values at
 5 the point in the sound field indicated by the dominance
 vector.

11. The method of claim 1, wherein the expanded sound
 field comprises a 9-point sound field, each said discrete
 point corresponding to a set of gain values predetermined
 to produce an optimized audio output at each of L,R,C,Ls,Rs
 5 speakers, respectively, when the two-channel subband audio
 signals are steered to that point in the expanded sound
 field.

12. A method of decoding two-channel matrix encoded
 audio to reconstruct multichannel audio that approximates
 a discrete surround-sound presentation, comprising:

providing two-channel matrix encoded audio that
 5 includes at least left, right, center, left surround and
 right surround (L,R,C,Ls,Rs) audio channels;

steering the two-channel matrix encoded audio in
 an expanded sound field that includes a discrete point for
 each said audio channel to reconstruct the multichannel
 10 audio; and

distributing the multichannel audio to a speaker
 configuration that includes a speaker for each of said
 L,R,C,Ls and Rs audio channels.

13. The method of claim 12, wherein each said
 discrete point corresponds to a set of gain values
 predetermined to produce an optimized audio output at each
 of the L,R,C,Ls,Rs speakers, respectively, when the two-
 5 channel matrix encoded audio is steered to that point in
 the expanded sound field.

14. The method of claim 13, wherein each said

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discrete point further includes a gain value predetermined to produce an optimized audio output at a center surround (Cs) speaker when the subband audio signal is steered to that point in the expanded sound field.

15. A method of decoding two-channel matrix encoded audio to reconstruct multichannel audio that approximates a discrete surround-sound presentation, comprising:

providing two-channel matrix encoded audio that includes at least left, right, center, left surround and right surround (L,R,C,Ls,Rs) audio channels;

subband filtering the two-channel matrix encoded audio into a plurality of two-channel subband audio signals;

separately steering the two-channel subband audio signals in an expanded sound field to form multichannel subband audio signals, said sound field having a discrete point for each said audio channel, each said discrete point corresponding to a set of gain values predetermined to produce an optimized audio output at each of L,R,C,Ls,Rs speakers, respectively, when the two-channel subband audio signals are steered to that point in the expanded sound field; and

synthesizing the multichannel subband audio signals in the subbands to reconstruct the multichannel audio.

16. The method of claim 15, wherein the reconstructed multichannel audio comprises a plurality of dominant audio signals that reside in different subbands.

17. The method of claim 15, wherein subband filtering groups the subband audio signals into a plurality of bark bands.

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18. The method of claim 15, wherein each said discrete point further includes a gain value predetermined to produce an optimized audio output at a center surround (Cs) speaker when the subband audio signal is steered to
5 that point in the expanded sound field.

19. The method of claim 15, wherein the expanded sound field comprises a 9-point sound field.

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